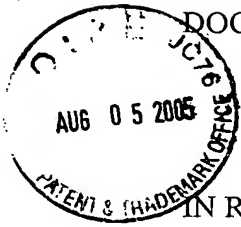


IFW



DOCKET NO.: 231753US6YA/phh

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF:

Eric J STRANG

SERIAL NO: 10/673,506

GROUP: 2825

FILED: September 30, 2003

EXAMINER: Vuthe SIEK

FOR: SYSTEM AND METHOD FOR USING FIRST-PRINCIPLES SIMULATION
TO ANALYZE A PROCESS PERFORMED BY A SEMICONDUCTOR
PROCESSING TOOL

LETTER

Mail Stop DD
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Submitted herewith is an International Search Report and Written Opinion for the Examiner's consideration. The reference(s) cited were cited in the Office Action dated March 23, 2005.

Respectfully Submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.

Gregory J. Maier
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Customer Number

22850

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Edwin D. Garlepp
Registration No. 45,330

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 231753WO	FOR FURTHER ACTION <small>see Form PCT/ISA/220 as well as, where applicable, item 5 below.</small>	
International application No. PCT/US04/28805	International filing date (<i>day/month/year</i>) 22 September 2004 (22.09.2004)	(Earliest) Priority Date (<i>day/month/year</i>) 30 September 2003 (30.09.2003)
Applicant TOKYO ELECTRON LIMITED		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 4 sheets.



It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the Report

- a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.



The international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. ☐ With regard to any nucleotide and/or amino acid sequence disclosed in the international application, see Box No. I.

2. ☐ Certain claims were found unsearchable (See Box No. II)

3. ☐ Unity of invention is lacking (See Box No. III)

4. With regard to the title,



the text is approved as submitted by the applicant.



the text has been established by this Authority to read as follows:

5. With regard to the abstract,



the text is approved as submitted by the applicant.



the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the drawings,

- a. the figure of the drawings to be published with the abstract is Figure No. 1



as suggested by the applicant.



as selected by this Authority, because the applicant failed to suggest a figure.



as selected by this Authority, because this figure better characterizes the invention.

- b. ☐ none of the figures is to be published with the abstract.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/28805

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : G06F 19/00
US CL : 700/121, 110

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
U.S. : 700/96-110, 118-121; 438/5-18, 946-950; 382/141, 154, 144-152; 356/401, 630

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Please See Continuation Sheet

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X,E	US 6,802,045 B1 (SONDERMAN et al) 05 October 2004 (05.10.2004), see entire document. ✓	1-25, 32-56, 63-66
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Y,E		26-31, 57-62
Y,E	US 2005/0016947 A1 (FATKE et al) 27 January 2005 (27.01.2005), see entire document. ✓	26-31, 57-62
A,E	US 2005/0010319 A1 (PATEL et al) 13 January 2005 (13.01.2005), see entire document. ✓	1-66
A,P	US 2004/0078319 A1 (MADHAVAN et al) 22 April 2004 (22.04.2004), see entire document. ✓	1-66
A	US 2003/0078738 A1 (WOUTERS et al) 24 April 2003 (24.04.2003), see entire document. ✓	1-66
A,E	US 6,812,045 B1 (NIKOONAHAD et al) 02 November 2004 (02.11.2004), see entire document. ✓	1-66
A,P	US 6,774,998 B1 (WRIGHT et al) 10 August 2004 (10.08.2004), see entire document. ✓	1-66
A,P	US 6,763,277 B1 (ALLEN, JR. et al) 13 July 2004 (13.07.2004), see entire document. ✓	1-66

☒ Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T"

later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X"

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y"

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"

document member of the same patent family

Date of the actual completion of the international search

11 July 2005 (11.07.2005)

Date of mailing of the international search report

19 JUL 2005

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Facsimile No. (703) 305-3230

Authorized officer

JOSE G. DEES

Telephone No. (571) 272-1607

Jose G. Dees

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US04/28805

C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A,P	US 6,728,591 B1 (HUSSEY, JR. et al) 27 April 2004 (27.04.2004), see entire document. ✓	1-66
A,P	US 6,628,809 B1 (ROWE et al) 30 September 2003 (30.09.2003), see entire document. ✓	1-66
A	US 6,571,371 B1 (COSS, JR. et al) 27 May 2003 (27.05.2003), see entire document. ✓	1-66
A	US 6,529,789 B1 (CAMPBELL et al) 04 March 2003 (04.03.2003), see entire document. ✓	1-66

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/28805

Continuation of B. FIELDS SEARCHED Item 3:

EAST: US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB

search terms: partial adj least jad quare adj analysis; partial adj least adj square adj analysis; loading adj coefficient; analysis; standard adj deviation; (standar adj deviation) same mean; semiconductor adj3 processing adj4 tool; metrology; input\$4 adj5 data adj5 process\$4; sensor; semiconductor adj2 process\$3 adj3; fault adj5 process; physical adj3 sensor; processing adj4 tool; multivariate adj analysis; semiconductor adj2 process\$3 adj3 tool; simulat\$3; fault adj5 process; simulat\$3 same model\$3; detect\$3 adj6 fault adj5 process; physical adj3 sensor; data adj5 process\$4; input\$4 adj5 data adj5 process\$4; sensor; simulation adj3 result

PATENT COOPERATION TREATY

OBLON, SPIVAK, MCCLELLAND
MAIER & NEUSTADT, P.C.

DOCKETING DEPT.

From the
INTERNATIONAL SEARCHING AUTHORITY

Initials/Date Docketed: PO 7/21/05

Type of Resp(s): _____

Date(s): _____

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

To: GREGORY J. MAIER OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, PC 1940 DUKE STREET ALEXANDRIA, VIRGINIA 22314

Date of mailing (day/month/year) 19 JUL 2005
FOR FURTHER ACTION See paragraph 2 below

Applicant's or agent's file reference 231753WO 6		
International application No. PCT/US04/28805	International filing date (day/month/year) 22 September 2004 (22.09.2004)	Priority date (day/month/year) 30 September 2003 (30.09.2003)
International Patent Classification (IPC) or both national classification and IPC IPC(7): G06F 19/00 and US Cl.: 700/96-110, 118-121; 438/5-18, 946-950; 382/141, 154, 144-152; 356/401, 630		
Applicant TOKYO ELECTRON LIMITED		

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/ US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230	Authorized officer JOSE G. DEES Telephone No. (571) 272-1607
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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US04/28805

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This opinion has been established on the basis of a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

☐ a sequence listing

☐ table(s) related to the sequence listing

b. format of material

☐ in written format

☐ in computer readable form

c. time of filing/furnishing

☐ contained in international application as filed.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US04/28805

Box No. V Reasoned statement under Rule 43 *bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)

Claims 1-66 YES

Claims NONE NO

Inventive step (IS)

Claims 1-66 YES

Claims NONE NO

Industrial applicability (IA)

Claims 1-66 YES

Claims NONE NO

2. Citations and explanations:

Claims 1-66 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest a system and method for using first-principles simulation to analyze a process performed by a semiconductor processing tool as claimed.

Claims 1-66 meet the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in industry.